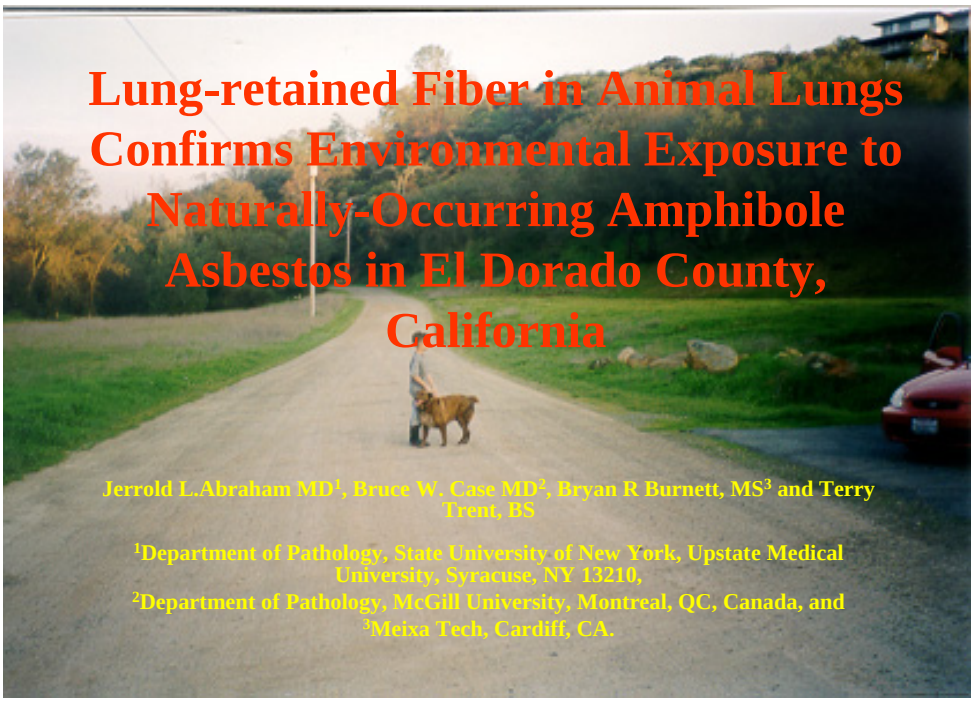


We are pleased to share what we feel is important scientific data collected recently in response to concerns by private citizens and scientists with long-standing interest in asbestos-related health hazards. The scientific part of this study was jointly led by Drs. Jerrold Abraham and Bruce Case. Mr. Terry Trent is a well known citizen-activist who recognized this problem several years earlier and helped organize the collection of some of the animal lungs and Mr. Bryan Burnett is an electron microscopist who has been performing lung fiber burden analyses with Dr. Abraham for over 20 years. All four authors also contributed to the financial costs of the analyses we are reporting. The title photo shows an animal in the situation identical to one of the affected animals which we studied.

•Naturally occurring deposits of asbestos (NOA) cause no human exposure if left undisturbed. However, mining, household use, or simple land development of areas containing asbestos fibers can release asbestos fibers into the air, resulting in potential exposures to humans and animals breathing that air.

•Recent concerns have been raised about asbestos exposure occurring in El Dorado County, California as a result of residential development over the past few decades. Local, state and federal agencies have done initial investigations and localized remediation of soils found to contain up to several percent by weight of tremolite asbestos.

•Non-occupational exposures and serious human health consequences of exposure to similar fibers are well documented from several sites throughout the world.

•In some areas such as the Quebec portion of the eastern serpentine belt, New Caledonia and parts of Turkey, there have been studies of lung fiber content of human residents, but this type of study is expensive and highly dependent on community and individual cooperation and consent.

•Dumortier et al. have reported the use of animals resident in areas of NOA as ‘bio-sensors’ for such asbestos exposures. In such circumstances the animal results are the ‘canary in the coal mine’.

Tremolite and similar exposures and non-occupational mesothelioma: a sample from published studies

COUNTRY (see references for area(s))	CASES	FIBER TYPE	MAJOR USE
Greece	**13**, 1985-94, area of 5000 residents	tremolite	whitewash
Turkey (Karain)	Over 50% of deaths	erionite	whitewash
Turkey (Southeast)	176	tremolite	Building materials, whitewash

Tremolite and similar exposures and non-occupational mesothelioma: a sample from published studies

COUNTRY (see references for area(s))	CASES	FIBER TYPE	MAJOR USE
Quebec	Five women	"High-Tremolite" serpentine area (mining nearby)	Four lived with chrysotile miners; one played in mine tailings
Corsica, Cyprus	14 (Corsica) 5 (Cyprus)	"High-Tremolite" serpentine areas (mining nearby)	"environmental" near high-tremolite chrysotile mines
New Caledonia	15, two year period	Tremolite outcrops	whitewash
China	From 6 to 22 per year in area of 68,000 residents	Crocidolite in surface soil	"environmental"

An Initial Analysis

- We obtained lungs from four deceased pets who had lived in the El Dorado area for varying periods of time.
- The goal of our analysis was to determine to what degree these animals accumulated tremolite asbestos in their lungs, and how this was related to time of residence.

Concerned Citizens from El Dorado County provided lungs from two adult dogs and two adult cats which had been euthanized for health reasons. We used standard electron microscopic methods (Lab 1 used SEM and Lab 2 used TEM) for lung fiber burden analyses. Experienced analysts performed the lung digestions and electron microscopy, with no knowledge of the animals' histories. The results of numerous analyses are presented in the following slide. [We use the terminology of "Tremolite/Actinolite" rather than reporting as either Tremolite or Actinolite, as fiber analyses often show a continuum of composition in this mineralogical group].

LUNG FIBER CONCENTRATION RESULTS FROM TWO LABORATORIES FOR FOUR ANIMALS: EL DORADO COUNTY, CALIFORNIA

Animal	El Dorado Home Asbestos Exposure	TR/ACT fibers >5um length Lab 1	TR/ACT fibers >5um length Lab 2	TR/ACT fibers >10um length Lab 1	TR/ACT fibers >10um length Lab 2
Cat2	none	0	0	0	0
Cat1	9+ yrs (mostly indoors)	86,000	157,000	86,000	157,000
Dog1	2+ yrs	1,250,000	566,500	192,000	412,000
Dog2	8+ yrs	9,162,000	928,000	2,030,600	928,000

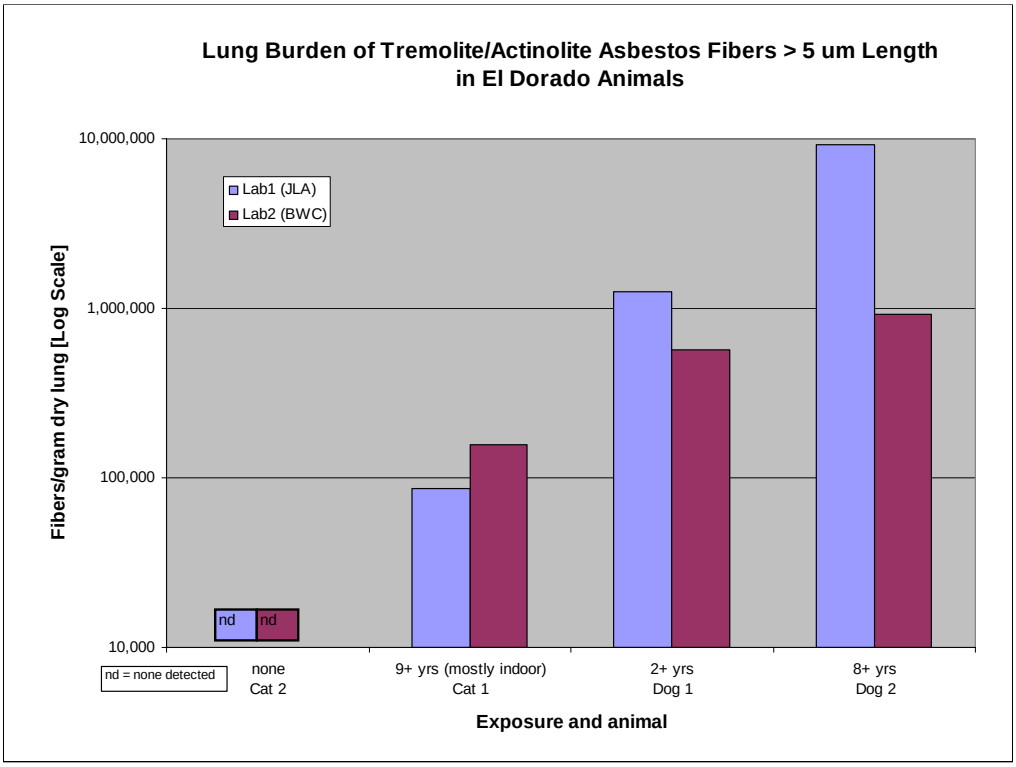
TR = tremolite

ACT = actinolite

Fiber concentrations in fibers per gram dry lung

This table shows the results of the lung fiber burden analyses from the FOUR animals from El Dorado County. Data from SEVEN analyses from Lab 1 and SEVEN analyses from Lab 2 are shown. [Absolute concentrations are not identical between the two labs, most likely a result of methodological differences]. All three animals with at least some residence in the areas containing Tremolite/Actinolite Asbestos fibers show elevated concentrations of Tremolite/Actinolite asbestos fibers in their lungs.

Not only were fibers longer than 5 micrometers present in concentrations increasing with the duration of exposure (residence), but also fibers longer than 10 micrometers (believed to be more capable of producing disease) can be seen to comprise a substantial proportion of the total asbestos fiber burden. Concentrations of nearly TEN MILLION fibers longer than 5 micrometers per gram of lung were measured in the animal with over 8 years residence in the area. The next slide shows these results presented in a chart form.



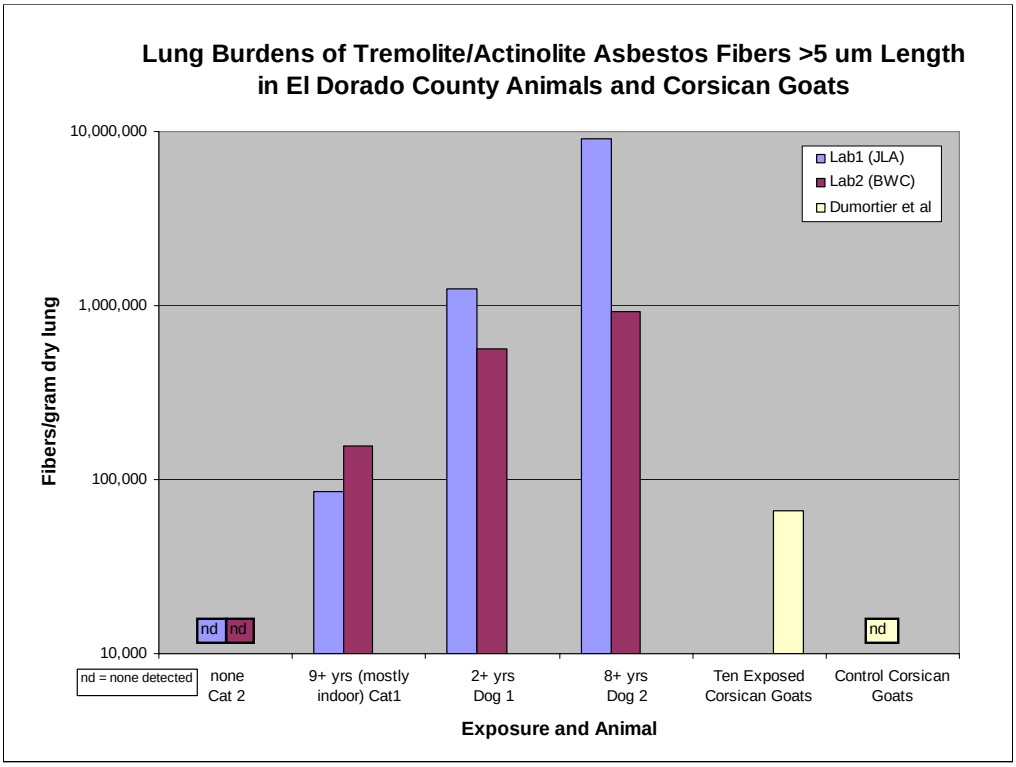
This chart shows that both independent laboratories obtained results consistent with a dose-response relationship between years of exposure and lung fiber burden of tremolite/actinolite asbestos. Note the data are presented on a log scale. Also note that neither laboratory detected any tremolite/actinolite fibers longer than 5 micrometers in the lung from the cat which had not resided in an area containing the tremolite/actinolite NOA.

An example of the use of animal results as surrogate for human exposures: Asbestos Fibers in goat lung in Corsica[1]

- Environmental exposures to chrysotile and tremolite from the soil occur, as do pleural plaques and mesothelioma, in northeast Corsica.
- Goats grazing in the contaminated areas inhale asbestos fibers.
- Investigators used this natural animal model to study whether these exposures actually result in increased lung fiber burdens by using analytical transmission electron microscopy to determine the LUNG FIBER CONTENT of ten goats from areas with asbestos outcrops.

1. **Dumortier P, Rey F, Viallat JR, Broucke I, Boutin C, De Vuyst P.** Chrysotile and tremolite asbestos fibres in the lungs and parietal pleura of Corsican goats. Occup Environ Med. 2002 Sep;59(9):643-6.

Naturally occurring tremolite asbestos is associated with development of pleural plaques and mesothelioma in humans. Drs. Pascal Dumortier and his colleagues have reported a study of asbestos fibers in the lungs of TEN goats living for 6 to 9 years in areas of asbestos outcrops, and two control goats. This is a model study using animals to monitor this type of exposure to asbestos. The next slide presents our results in El Dorado County in comparison to the results of Dumortier's group's results from the Corsican goats.



In the Corsican Goats, Tremolite asbestos fibers accounted for 78% of the fibers longer than 5 micrometers in lung samples at an average concentration of 84,000 fibers per gram of dry lung for the TEN exposed Goats. No asbestos was detected in the TWO control goats.

Although direct comparison is difficult, the Tremolite asbestos fiber concentrations in our three exposed El Dorado animals are substantially higher than those in the same size range in the Corsican goats.

1. We have reported here analyses of lung fiber content for two dogs and two cats residing for different durations in the El Dorado, California area.
2. Results of electron microscopic lung fiber burden analyses by two independent laboratories are presented.
3. Results from BOTH labs show greatly elevated lung burdens of the tremolite/actinolite type of asbestos fibers > 5 micrometers length in the dogs, with the higher burden in the dog residing for more years in the contaminated area; lower levels in one cat who remained mostly indoors; and no detectable amphibole asbestos in the cat which had not lived in the contaminated area at all.
4. In previous studies a larger number of dogs from another state (Kansas) demonstrated age-related increase in dust in the lungs, with the dust matching the composition of the soil to which the dogs were exposed [Schoning et al, 1996]. No asbestos fibers were noted in any of those dogs' lungs.

SUMMARY

•The concentrations of amphibole asbestos fibers in our dog lungs are substantially higher than those found in goats from Corsica, where an exposure to environmental tremolite asbestos is ***clearly associated with human mesothelioma occurrence.***

•Our results demonstrate that amphibole asbestos fibers from NOA in the El Dorado situation are being inhaled and retained in the lungs of animals residing in that area ***in direct proportion to time spent in the area***.

CONCLUSIONS

•It is likely that human exposures from such developments in this area and similar areas **have already occurred**, and because the main disease of concern (mesothelioma) takes decades to develop excesses will be difficult to detect until considerable time passes.

•Prudent Public Health action to prevent further exposures seems indicated *without waiting for this to happen.*

We have FIVE straightforward CONCLUSIONS which we share with you today.

Read them…

Thank you for allowing us to present this information at this meeting. We regret not being able to attend the meeting in person, but we will be glad to respond to questions submitted to us in writing after the meeting.

CONCLUSIONS (continued)

•In our view, there should be serious consideration given to a moratorium on further development of roads, schools, and housing construction on such sites with exposed amphibole asbestos.

•Additionally, long-term follow up of those already potentially exposed (especially as young children) seems indicated.

• Analyses of a larger group of animal and human lung tissue will provide additional quantitative data.

We have FIVE straightforward CONCLUSIONS which we share with you today.

Read them…

Thank you for allowing us to present this information at this meeting. We regret not being able to attend the meeting in person, but we will be glad to respond to questions submitted to us in writing after the meeting.

Background and Disclaimers

- Drs. Abraham (JLA) and Case (BWC) have a combined experience of over 50 years of research in asbestos-related disease.
  - JLA is Professor of Pathology at SUNY Upstate Medical University and Director of Environmental and Occupational Pathology. He maintains an active California Medical License.
  - BWC is Associate Professor, Pathology and Associate Member, Combined Department of Epidemiology, Biostatistics and Occupational Health, and Associate Member, School of Environment, McGill University.
- Neither has any direct involvement with any agencies or commercial concerns in the El Dorado area.

Background and Disclaimers

- The animal lungs were kindly donated at the time of euthanasia by concerned citizens with the assistance of their family veterinarians.
- The costs of the electron microscopic analyses of the animals' lungs came from the personal research accounts of JLA and BWC and from a private citizen (TT) and one electron microscopist (BRB).
- Dr. Case and Dr. Abraham have served as paid consultants and experts to health agencies, unions, and to law firms representing plaintiffs or defendants in asbestos litigation

END of Presentation!